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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,274	05/08/2001	Hiroshi Kubota	5576-125	3436

20792 7590 10/15/2003

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EXAMINER	
LEE, SIN J	

ART UNIT	PAPER NUMBER
1752	

DATE MAILED: 10/15/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/851,274	Applicant(s) KUBOTA ET AL.	
	Examiner Sin J Lee	Art Unit 1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspond nce address --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *1-4 and 9-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 9-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Due to new grounds of rejections, the finality of the Office action mailed on January 22, 2003 is hereby withdrawn, and the following rejections are made *non-final*.

Claim Rejections - 35 USC § 103

2. Claims 1-4 and 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabe et al (6,159,656) (with Chen et al (6,174,661 B1) which is cited here to support the Examiner's position that "Florad FC430" and "FC431" are fluorinated alkyl esters).

Kawabe teaches a chemical amplification type positive resist composition suitable for exposure to far UV rays (220 nm or shorter wavelength) which comprises a *polymer*, a *solvent*, and at least one of a fluorine type surfactant and a silicone type surfactant (in Kawabe's Examples 1 and 2, "Megafac F176" (a fluorine type surfactant) is used). See col.3, lines 37-65, col.45, lines 55-56, and Table 1 in col.49-50. Kawabe also teaches (col.44, lines 64-67) that a nonionic surfactant can be further added for the purpose of improving the applicability of each photosensitive resin composition of his invention or improving developability. Therefore, based on this teaching, one of ordinary skill in the art would immediately envisage adding a nonionic surfactant to Kawabe's resist composition in order to improve the applicability of the photoresist composition and improve developability. None of the examples which Kawabe lists in col.45, lines 1-7 for his nonionic surfactant includes any fluorine substituent or a silicon-

containing substituent. Therefore, Kawabe teaches present non-ionic surfactant having neither a fluorine substituent nor a silicon-containing substituent.

With respect to present limitation as to the amount of the non-ionic surfactant (10-2000 ppm), Kawabe does not explicitly disclose the presently claimed amount. However, since Kawabe clearly teaches that the nonionic surfactant is being added for the purpose of *improving the applicability of the photoresist composition* and improving developability, it would have been obvious to one of ordinary skill in the art to optimize the amount of the nonionic surfactant in Kawabe's invention so as to obtain optimum result, i.e., optimum applicability and optimum developability of Kawabe's photoresist composition. It is also the Examiner's position that this optimized amount will be overlapping with present range of 10-2000 ppm because present invention is also trying to *improve the coating property* of its resist material by including in the resist material a nonionic surfactant having neither a fluorine substituent nor a silicon-containing substituent (in their arguments presented in Appellants' Brief, applicants clearly state that the nonionic surfactant having neither a fluorine substituent nor a silicon-containing substituent is used in the present invention to *improve poor coating properties*, to suppress the occurrences of microbubbles in solution, and to lower the occurrences of a variety of defects causing the yield reduction in the device manufacturing step). Therefore, the prior art's teaching would render obvious present inventions of claims 1, 3, 17.

With respect to present claims 2, 4, and 18, Kawabe teaches (col.45, lines 1-7) only eight examples to choose from for his nonionic surfactant. Among those eight, polyoxyethylene lauryl ether and polyoxyethylene steary ether are presently claimed

polyoxyalkylene alkyl ethers, and polyoxyethylene otylphenyl ether and polyoxyethylene nonylphenyl ether are presently claimed *polyoxyalkylene aralkyl ethers*. Since there are only eight examples to choose from, it is the Examiner's position that one of ordinary skill in the art would immediately envisage using any one of polyoxyethylene lauryl ether, polyoxyethylene steary ether, polyoxyethylene otylphenyl ether, and polyoxyethylene nonylphenyl ether as Kawabe's nonionic surfactant. Therefore, the prior art's teaching would render obvious present inventions of claims 2, 4, and 18.

Kawabe teaches (col.45, lines 51-58) that his photosensitive resin composition is applied on a substrate, and the coating film is subjected to pre-bake and then exposed to an exposure light having a wavelength of 220 nm or shorter through a given mask. The exposed film is subjected to post-exposure bake and then developed to obtain a satisfactory resist pattern. Therefore, Kawabe's teaching would render obvious present inventions of claims 13-16 (Kawabe's taught examples exemplify the resist film being exposed to ArF excimer laser (193 nm) light through a mask (col.50, lines 33-39), and the exposure light having a wavelength of 220 nm or less such as ArF excimer laser (193nm) meets present limitation of a high energy radiation having a wavelength of less than 500 nm).

With respect to present claims 9 and 19, Kawabe uses Megafac F176 (fluorine type surfactant) in his Examples 1 and 2, and the prior art teaches equivalence of this surfactant to Florad FC430 and FC431 in col.43, lines 46-56. Since the prior art teaches equivalence of these compounds, it is the Examiner's position that it would have been obvious to one of ordinary skill in the art to use Florad FC430 or FC431 in place of the Megafac F176 in Kawabe's Examples 1 and 2 with a reasonable

expectation of achieving a positive photosensitive resin composition which shows excellent performances with respect to the residual film ratio, resist profile, resolution, and dry-etching resistance. Florad FC430 and FC431 are fluorinated alkyl esters as evidenced by Chen et al, col.7, lines 22-23. Therefore, Kawabe's teaching would render obvious present invention of claim 9.

With respect to present claim 10, Kawabe teaches that his fluorine type and/or silicon type surfactant is present preferably from 0.01 to 1 part by weight per 100 parts by weight of the composition of his invention (0.01-1 wt%). Since present range of 10 to 2,000 ppm converts to 0.001-0.2%, the prior art's range overlaps with present range and thus would render the present range *prima facie* obvious. In the case "where the [claimed] ranges overlap or lie inside ranges disclosed by the prior art," a *prima facie* case of obviousness would exist which may be overcome by a showing of unexpected results, In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Therefore, the prior art's teaching would render obvious present invention of claim 10.

With respect to present claims 11, 12, and 20, Kawabe does not explicitly disclose the weight ratio of the non-ionic surfactant to the fluorine surfactant (although the prior art teaches the amount for the fluorine surfactant). However, since Kawabe teaches that the nonionic surfactant is being added for the purpose of improving the applicability of the photoresist composition and improving developability, it would have been obvious to one of ordinary skill in the art to optimize the amount of the nonionic surfactant in Kawabe's invention so as to give optimum result, i.e., optimum applicability and optimum developability of Kawabe's photoresist composition. It is also the Examiner's position that this optimized amount will be overlapping with present range of

10-2000 ppm because present invention is also trying to *improve the coating property* of its resist material by including in the resist material a nonionic surfactant having neither a fluorine substituent nor a silicon-containing substituent. Therefore, since the prior art's range for the amount of the fluorine surfactant also overlaps with the present range for the amount of the fluorine surfactant (as discussed above), the weight ratio of Kawabe's non-ionic surfactant to Kawabe's fluorine surfactant will also be overlapping with present range of 0.1 or greater. Therefore, Kawabe's teaching would render obvious present inventions of claims 11, 12, and 20.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is (703) 305-0504. The examiner can normally be reached on Monday-Friday from 8:30 am EST to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Janet Baxter, can be reached on (703) 308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9311 for after final responses or (703) 872-9310 for before final responses.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0661.

S. J. L.
S. Lee
10/14/03

JANET BAXTER
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